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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 31.B1064.12.WO.1	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IT 03/00864	International filing date *(day/month/year)* 30.12.2003	Priority date *(day/month/year)* 30.12.2003
International Patent Classification (IPC) or both national classification and IPC INV. A63B69/40		
Applicant BENETTI, Alfredo ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
27.07.2005	30.03.2006
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Williams, M Telephone No. +31 70 340-3521

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IT 03/00864

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-17 as originally filed

Claims, Numbers

1-38 filed with telefax on 10.02.2006

Drawings, Sheets

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

   ☐ the entire international application,

   ☒ claims Nos. 15-17

   because:

   ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

   ☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 15-17 are so unclear that no meaningful opinion could be formed *(specify)*:

   see separate sheet

   ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

   ☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

   ☐ the written form has not been furnished or does not comply with the Standard.

   ☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-14,18-38
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-14,18-38
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14,18-38
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The subject-matter of claims 15-17 is contradictory to the subject-matter of independent claim 1, in particular in regard to the position of throttling means (37).

1.1 Independent claim 1 specifies an apparatus for launching balls which comprises, amongst other things:

> "...a rapid opening device (6) for discharging on command said fluid from said tank (2) to said launch tube (3) through said exhaust duct (5); and throttling means (37) mounted in said exhaust duct (5)...".

From this wording it is understood that rapid opening device (6) controls the entry of fluid into the exhaust duct (5). This understanding is supported by page 4, lines 21-22 of the description, which discloses:

> "...the quick opening device (6) comprises a quick opening main valve (9) which controls the discharge of the fluid from the tank (2) to the exhaust duct (5)..."

Correspondingly, claim 6 specifies that the main valve (9) is part of the *quick* (i.e. rapid) opening device (6).

1.2 The exhaust duct (5) is understood to correspond solely to the tubular duct whose end is in contact with the main valve (9). This is clear from page 10, lines 13-18 of the description, which discloses:

> "In the specific case, in the main valve (9) the first disc obturator (12) slides within a cylindrical portion (46) of the first chamber (13), and it has an inner wall (47) oriented towards the first chamber (13), and an outer wall (48) whose central part faces the exhaust duct (5), and whose peripheral annular part instead faces the fluid tank (2). In this way, when the disc is in closed position, it bears on the exhaust duct (5) and the seal is assured by a first sealing ring (49) (made, for instance, of a resilient material such as rubber) which separates the central part from the annular part".

According to this passage, since the central part of the outer wall (48) of the first disc obturator (12) (of the main valve (9)) ***faces*** the exhaust duct (5), it cannot therefore be ***in*** said exhaust duct (5). Therefore, no part of the main valve (9) is ***in*** said exhaust duct (5), and so no part of the rapid (or *quick*) opening device (6) is in said exhaust duct (5).

Furthermore, exhaust duct (5) is clearly indicated in figures 2 and 4 as being the tubular duct whose end is in contact with the main valve (9).

1.3 Claim 15 is dependent on the combination of all of claims 1, 6, 7 and 9 (and optionally claim 8). Claim 15 specifies:

> "...said throttling means (37) allow to vary the fluid passage section in the main valve (9), acting on the travel of the first obturator (12)".

This claim attempts to specify that the throttling means (37) are adapted to adjust the spacing between the first obturator (12) and the end of the exhaust duct (5) when the main valve (9) is fully open. However, for the reasons given in 1.1 and 1.2 above, the main valve (9) is not in exhaust duct (5). Therefore, the spacing between the first obturator (12) and the end of the exhaust duct (5), i.e. the restriction constituting such throttling means, is necessarily outside the exhaust duct (5). This is contradictory to the specification of claim 1, which specifies:

> "...throttling means (37) mounted in said exhaust duct (5)...".

1.4 Claims 16 and 17, respectively, merely specify embodiments of throttling means which are consistent with claim 15, and therefore contradictory to the specification of claim 1, to the extent that they refer to embodiments in which the throttling means are outside the exhaust duct (5).

In the case of claim 17 (corresponding to figure 10), the inner part (63) of the exhaust duct (5) is adjustable axially, but the throttling means are still outside the exhaust duct (5). In this embodiment, the throttling means cannot be considered to be "mounted in the exhaust duct (5)" since the throttling means are constituted by the exhaust duct (5) itself (specifically the end of the exhaust duct (5)) in cooperation with first obturator (12). Moreover, although inner part (63) of exhaust duct (5) slides in telescopic fashion inside another part of exhaust duct (5), inner part (63) cannot be considered to be mounted in the exhaust duct (5) because in

fact it forms part of the exhaust duct (5).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents (D):

   D1: US-A-4 951 644 (BON) 28 August 1990 (1990-08-28)
   D2: US-A-5 647 338 (MARTIN) 15 July 1997 (1997-07-15)

2.1 Document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document):

an apparatus *suitable for* launching balls for sports practice comprising: a tank (50) for housing a gaseous fluid under pressure; a launch tube (12) whose section substantially corresponds to that of a ball to be launched, said tube having an open end for launching the ball and having a seat for positioning the ball; an exhaust duct (60) of the fluid operatively connected between said tank (50) and said launch tube (12); a rapid opening device (34, 32, 80) for discharging on command said fluid from said tank (50) to said launch tube (12) through said exhaust duct (60), to cause the launching of the ball; and throttling means (90) mounted in said exhaust duct (60),said throttling means (90) being adapted to be adjusted for varying the effective section of the exhaust duct (60) (see column 2, line 12 to column 3, line 53 and fig's 1, 2).

2.2 The subject-matter of claim 1 therefore differs from this known document D1 in that:

said throttling means are adapted to be adjusted for varying the effective section of the exhaust duct such that said effective section determined by the throttling means remains the same during a whole launch.

The subject-matter of claim 1 therefore meets the requirements of Article 33(2) PCT.

2.3 The problem to be solved by the present invention may therefore be regarded as:

to provide an apparatus for launching balls for sports practice that is able to launch a ball, with precision, reproducibility and adjustable launch velocity (see for example description page 2, lines 19 to 21 and page 2, line 25 to page 3, line 2).

2.4 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

- document D1 discloses an apparatus *suitable for* launching balls for sports practice, but the throttling means (90) mounted in the exhaust duct (60) are adapted to adjust the effective section of the exhaust duct (60) during a launch automatically in response to the pressure in the barrel (112). The purpose of this is to protect the object to be launched against g-force levels above a predetermined safe level (see column 3, lines 37-47 of this document). The throttle means (90) in the apparatus disclosed in document D1 is not adapted to provide adjustable launch velocity.

- document D2 discloses an apparatus for launching balls for sports practice, but the throttling means (profile of fluid control valve (21) downstream of control chamber (10)) are not adjustable.

The subject-matter of claim 1 therefore meets the requirements of Article 33(3) PCT.

2.5 Claims 2-14 and 18-38 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

REMARKS:

A. Claims 28 and 31 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. In each case the claim attempts to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

Claim 28 specifies that the apparatus comprises "means for enhancing launch precision", but this claim lacks the technical features required to achieve enhanced launch precision. Suitable features are, for example, specified in claim 29.

Claim 31 specifies that the apparatus comprises "launch noise reducing means", but this claim lacks the technical features required to reduce launch noise. Suitable features are, for example, specified in claim 32.

B. The features of the characterising part of claim 1 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

C. According to the requirements of Rule 10.2 PCT, the terminology and the signs shall be consistent throughout the application. This requirement is not met in view of the use of the expressions "rapid opening device" and "quick opening device" for the same feature (6) (see claims 1, 6, 7 and 8 and description).

D. Neither of the two variants of the fourth embodiment (page 7, line 16 to page 8, line 1 and fig's 9 and 10) falls within the scope of independent claim 1, in that, in each variant, the throttle means (37) are not mounted in the exhaust duct (5) (see also Item III above).

E. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.

CLAIMS

1. An apparatus for launching balls for sports practice comprising:

a tank (2) for housing a gaseous fluid under pressure;

a launch tube (3) whose section substantially corresponds to that of a ball (4) to be launched, said tube having an open end (7) for launching the ball (4) and having a seat (8) for positioning the ball (4);

an exhaust duct (5) of the fluid operatively connected between said tank (2) and said launch tube (3); and

a rapid opening device (6) for discharging on command said fluid from said tank (2) to said launch tube (3) through said exhaust duct (5), to cause the launching of the ball (4); ***and*** ~~characterised in that it further comprises~~ throttling means (37) mounted in said exhaust duct (5) ~~to cause the transfer of the fluid from the tank (2) to launch tube (3).;~~ ***characterised in that said throttling means are adapted to be adjusted for varying the effective section of the exhaust duct such that said effective section determined by the throttling means remains the same during a whole launch.***

~~2. An apparatus as claimed in claim 1 characterised in that said throttling means (37) allow to regulate the transfer of the fluid from the tank (2) to the launch tube (3).~~

3 2. An apparatus as claimed in claim 1 ~~or 2~~ characterised in that said throttling means (37) comprise a fixed part (38) and a movable part (39) relative to the fixed part (38), the displacement of said movable part (39) relative to said fixed part (38) determining a variation in the effective section of the exhaust duct (5) in correspondence with the throttling means (37).

4 3. An apparatus as claimed in claim ~~3~~ **2** characterised in that said movable part (39) is constituted by a bulb obturator.

5 4. An apparatus as claimed in claim ~~3~~ **2** characterised in that said movable part (39) is constituted by a sleeve whose outer wall (40) slides in proximity to the fixed part (38) and which has a narrowing (41) in corresponding with its own inlet section for the fluid, and one or more slits (42) extending astride the fixed part.

6 5. An apparatus as claimed in claim 1 ~~or 2~~ characterised in that said throttling means (37) comprise one or more interchangeable ring nuts (61), each ring nut (61) defining a different throttling

of the fluid transit section in the exhaust duct (5).

~~7~~ **6.** An apparatus as claimed in any of the previous claims, characterised in that said quick opening device (6) comprises at least a main valve (9) with rapid opening which controls the discharge of the fluid from the tank (2) to the exhaust duct (5).

~~8~~ **7.** An apparatus as claimed in claim ~~7~~ ***6*** characterised in that said quick opening device (6) further comprises at least an actuation valve (11) which determines the actuation of the main valve (9).

~~9~~ **8.** An apparatus as claimed in claim ~~8~~ ***7*** characterised in that said quick opening device (6) further comprises at least a control valve (10) which drives the opening of the main valve (9) and is in turn controlled by the actuation valve (11).

~~10~~ **9.**An apparatus as claimed in claim ~~8 or 9~~ ***7 or 8*** characterised in that said main valve (9) comprises a first movable obturator (12) actuated by means of a pressurisable first chamber (13), said first obturator (12) being in the closed position when said first chamber (13) is pressurised and going to the open position when the first chamber (13) is depressurised, said control valve (10) causing, when it is opened, the depressurisation of the first chamber (13).

~~11~~ **10.** An apparatus as claimed in claims ~~9 and 10~~ ***8 and 9*** characterised in that said control valve (10) comprises a second movable obturator (14) actuated by means of a second pressurisable chamber (15), said second obturator (14) being in the closed position when said second chamber (15) is pressurised and going in the open position when the second chamber (15) is depressurised, said actuating valve (11) causing, when it is opened, the depressurisation of the second chamber (15).

~~12~~ **11.** An apparatus as claimed in claim ~~8, 9, 10 or 11~~ ***7, 8, 9 or 10***, characterised in that said actuating valve (11) is a solenoid valve.

~~13~~ **12.** An apparatus as claimed in claim ~~8, 9, 10, 11 or 12~~ ***7, 8, 9, 10 or 11*** characterised in that said actuating valve (11) is remotely controllable.

~~14~~ **13.** An apparatus as claimed in claim ~~8, 9, 10, 11 or 12~~ ***7, 8, 9, 10 or 11*** characterised in that said actuating valve (11) is a manual valve.

~~15~~ **14.** An apparatus as claimed in claim ~~8, 9, 10, 11 or 12~~ ***7, 8, 9, 10 or 11*** characterised in that it comprises two parallel actuating valves (11), a manually operated valve and a solenoid valve.

~~16~~ **15.** An apparatus as claimed in claim ~~10~~ ***9*** characterised in that said throttling means (37) allow

to vary the fluid passage section in the main valve (9), acting on the travel of the first obturator (12).

~~17~~ **16.** An apparatus as claimed in claim ~~16~~ ***15*** characterised in that said throttling means (37) comprise one or more interchangeable inserts (62) able to be inserted into the first chamber (13) to vary the travel of the first obturator (12).

~~18~~ **17.** An apparatus as claimed in claim ~~16~~ ***15*** characterised in that said throttling means (37) allow the inner part (63) of the exhaust duct (5), against whose end (64) bears in closure the first obturator (12), to be adjustable axially.

~~19~~ **18.** An apparatus as claimed in any of the previous claims, characterised in that it further comprises a circuit (20) for pressurising said tank (2).

~~20~~ **19.** An apparatus as claimed in claim ~~10 and 19~~ ***9 and 18*** characterised in that said pressurisation circuit (20) also pressurises said first chamber (13), the tank (2) and the first chamber (13) being in fluid communication.

~~21~~ **20.** An apparatus as claimed in claim ~~11 and 19~~ ***10 and 18*** characterised in that said pressurisation circuit (20) also pressurises said second chamber (15), the tank (2) and the second chamber (15) being in fluid communication.

~~22~~ **21.** An apparatus as claimed in claim ~~19, 20 or 21~~ ***18, 19 or 20*** characterised in that said pressurisation circuit (20) allows the automatically recharging of the tank (2) after each launch.

~~23~~ **22.** An apparatus as claimed in any of the previous claims, characterised in that it further comprises means (43) for varying the position of said seat (8) for the ball (4) to be launched in said launch tube (3).

~~24~~ **23.** An apparatus as claimed in claim ~~23~~ ***22*** characterised in that said throttling means (37) and said means (43) for varying the position of the seat (8) for the ball (4) are operatively associated to vary the position of the seat (8) according to the regulation of the transfer of the fluid from tank (2) to the launch tube (3) and vice versa, according to a predetermined relationship.

~~25~~ **24.** An apparatus as claimed in claims ~~3 and 24~~ ***2 and 23*** characterised in that said seat (8) for the ball (4) to be launched is rigidly connected to the mobile part (39) of the adjustment means, the displacement of the movable part (39) causing a corresponding displacement of the seat (8) for the ball (4) to be launched within the launch tube (3).

~~26~~ **25.** An apparatus as claimed in claims ~~6 and 24~~ ***5 and 23*** characterised in that each

interchangeable ring nut (61) also determines a different positioning of the seat (8) for the ball (4) within the launch tube (3).

~~27~~ **26.** An apparatus as claimed in any of the previous claims, characterised in that between the seat (8) for the ball (4) and the end of the launch tube (3) opposite the open end (7) is also identified, when the ball (4) is in the seat (8), a third chamber (45) in which the fluid expands at the moment of the launch, and in that said exhaust duct (5) is connected to the launch tube (3) in correspondence with the seat (8) for the ball (4).

~~28~~ **27.** An apparatus as claimed in any of the previous claims, characterised in that the tank (2) has variable volume.

~~29~~ **28.** An apparatus as claimed in any of the previous claims, characterised in that it further comprises means for enhancing launch precision (67).

~~30~~ **29.** An apparatus as claimed in claim ~~29~~ ***28*** characterised in that said means for enhancing launch precision (67) are constituted by an annular element (69) positioned at an appropriate distance from the open end (7) of the launch tube (3).

~~31~~ **30.** An apparatus as claimed in claim ~~30~~ ***29*** characterised in that the annular element (69) has a slightly greater inner diameter than the inner diameter of the launch tube (3).

~~32~~ **31.** An apparatus as claimed in any of the previous claims, characterised in that it further comprises launch noise reducing means (68).

~~33~~ **32.** An apparatus as claimed in claim ~~32~~ ***31*** characterised in that the noise reducing means (68) are constituted by an annular chamber (71), of adequate volume, mounted coaxially to the launch tube (3), and having an inner slit (72) obtained in correspondence with the open end (7) of the launch tube (3), and a plurality of lateral slits (73).

~~34~~ **33.** An apparatus as claimed in claim ~~33~~ ***32*** characterised in that the total passage section in said annular chamber (71) is not much smaller than the section of the launch tube (3).

~~35~~ **34.** An apparatus as claimed in claim ~~33 or 34~~ ***32 or 33*** characterised in that the inner surfaces of the annular chamber (71) are coated with sound absorbing material.

~~36~~ **35.** An apparatus as claimed in any of the previous claims, characterised in that said fluid is air.

~~37~~ **36.** An apparatus as claimed in any of the previous claims, characterised in that it further comprises a support structure which allows to adjust the orientation of the launch tube (3).

 AMENDED SHEET

~~38~~ 37. An apparatus as claimed in any of the previous claims, characterised in that it further comprises a programmable electronic unit which can enable its automated and remotely controlled operation.

~~39~~ 38. An apparatus as claimed in any of the previous claims, characterised in that the exhaust duct (5) has a smaller section than the launch tube (3).